

MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/22/93 12:05:07á

----- ASTRO FORUM appended at 11:05:20 on 93/03/22 GMT (by ALEXD at WINVMJ) ---  
Subject: Meteor observation

I am not an astronomer, but on my regular night-time walks with the dog, I take a keen but (very) amateur interest in the sky. On Friday night (19 March, 2310 GMT) I saw what, to me, was a very unusual meteor, and I would appreciate comment from the forum as to exactly how uncommon it was.

The night was clear and cold, no moon, and I live about 10 miles from the nearest street lighting, in a rural area with virtually zero traffic at that time. I was near some trees when I thought that a car's headlights were shining on the trees. The light flickered, and my next thought that there was lightning in the sky. As I swung round I saw out of the corner of my eye a meteor trail from just East of Ursa Major. When I've seen meteors in the past they have been just a an instantaneous pencil line drawn across the sky, but this was broad (don't know how to estimate, I'm afraid) and consisted of millions of small sources of light that gradually faded out over a matter of 4-5 seconds.

I'd appreciate knowing just how common is a meteor bright enough to light up the surface of the earth - or was it a meteor? A satellite falling back to Earth perhaps? Any advice gratefully received.

Alex Down

ÿÿ NO SUBJECT

MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/22/93 15:25:14á

----- ASTRO FORUM appended at 14:27:50 on 93/03/22 GMT (by LUERICH at RALVM0) -  
Subject: Meteor observation  
Ref: Append at 11:05:20 on 93/03/22 GMT (by ALEXD at WINVMJ)

It was probably a meteor that had exploded during entry to the Earth's atmosphere. Did you hear any sound, such as a pop or bang? As for estimating the width, do you recall if it was, say as wide as the width of a finger, held at arm's length? Wider?

In 1985, I saw a meteor bright enough to light up the ground. One of my professors, who also witnessed it, said he hadn't seen anything like it in 15 years of professional astronomy. It rivaled the brightness of the full moon.

So...keep looking up!

S.A. (Susan) Luerich

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MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/22/93 16:00:06á

----- ASTRO FORUM appended at 14:59:53 on 93/03/22 GMT (by ALEXD at WINVMJ) ---

Subject: Meteor observation

Ref: Append at 14:27:50 on 93/03/22 GMT (by LUERICH at RALVM0)

There was no sound that I was aware of; the trail was about the width of my little finger at arm's length. Assume the explosion occurred at, say, 50 miles high(reasonable?) - according to my calculations, it should have been visible from at least 1 million square miles of the Earth's surface, and the flash would have lit up a significant part of that area. Sounds like a might big flash bulb to me! Is there any way in which the size of the meteor can be estimated from the amount of light emitted?

Alex Down

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§MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/22/93 16:52:54á

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----- ASTRO FORUM appended at 15:51:07 on 93/03/22 GMT (by MARKL2 at HOUVMSCC)

Subject: Meteor observation

Ref: Append at 14:59:53 on 93/03/22 GMT (by ALEXD at WINVMJ)

I once saw something like what you describe: a large object trailing a shower of "sparks". It reminded me of fireworks. The amazing thing was that it was clearly visible in broad daylight! There was no sound.

Mark A. Lauritsen

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§MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/22/93 18:00:31á

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----- ASTRO FORUM appended at 17:03:11 on 93/03/22 GMT (by LUERICH at RALVM0) -

Subject: Meteor observation

Ref: Append at 14:59:53 on 93/03/22 GMT (by ALEXD at WINVMJ)

I don't think one needs to assume that the meteor must explode on entry to the Earth's atmosphere (I should have said "as it passes through..."). It would depend on its original size, speed, and construction (cracks where gasses could build up, expand, and explode). And it may have been a more gentle disintegration than an explosion. Because of all the variables, I don't think you could determine mass from brightness.

Cheers,  
Susan Luerich

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§MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/23/93 21:26:20á

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----- ASTRO FORUM appended at 20:25:41 on 93/03/23 GMT (by BOWKER at CANVM2) --

Subject: Meteor observation

Ref: Various

In comment to several of the appends on this subject:

Very bright and sustained meteor trails are fairly common, although few people see more than one or two in a lifetime. Some are bright enough to

be visible in the daytime; there are even movies of some.

It's likely that many similar objects strike the earth all the time, but on vertical trajectories, over the ocean ... so they zip in fast, hardly have a chance to burn up, and drop into water and aren't seen. It is much rarer for an object to come in at a low angle, at the right speed over land to produce a 'slow' and highly visible event.

Estimating the size of the trail is to chase an illusion. The contrast fools all eyes, as is the case for lightning bolts. The actual object is quite small, say baseball-sized, but in burning up it may leave quite a trail of debris, especially in the lower atmosphere, that can persist for many minutes. I recall one many years ago where the trail persisted for at least 20 minutes, slowly twisting in the high altitude winds.

Re-entering satellites generally have a different appearance, as they are larger and throw off a lot of loose junk as they burn.

Really big objects are less spectacular (but far more dangerous) since the bulk of the object, and its momentum, reaches the ground without much change. This causes large holes, dinosaur extinctions, etc.

The 'sparkles' reported could be real (like iron filings in a flame) or might be an illusion caused by the contrast.

Finally, while most meteors are a quick flash as described, any patient observer willing to sit outside for a few hours can probably see a couple of brighter ones. Picking a night when a 'slow' meteor shower is expected can improve the odds considerably.

Perry Bowker, Announcement Operations, Toronto, Canada. 03/23/93 15:25:36  
Send direct mail to BOWKER at CANVM2  
Phone (416) 946-3873 US Tie 886-3873

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/23/93 21:34:51á

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----- ASTRO FORUM appended at 20:36:27 on 93/03/23 GMT (by NORTHRD at PKMFGVM1)

Subject: Meteor observation

Ref: Append at 20:25:41 on 93/03/23 GMT (by BOWKER at CANVM2)

Paul, Can you expand upon what a "Slow" shower is? (No wisecracks please) I've haven't heard that term before. And can you give examples (Names & Date ranges)?

7 days to surplus - Dave Northrup

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/23/93 22:01:23á

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----- ASTRO FORUM appended at 20:36:27 on 93/03/23 GMT (by NORTHRD at PKMFGVM1)

..... ASTRO FORUM modified at 20:39:27 on 93/03/23 GMT (by NORTHRD at PKMFGVM1)

Subject: Meteor observation

Ref: Append at 20:25:41 on 93/03/23 GMT (by BOWKER at CANVM2)

Perry, Can you expand upon what a "Slow" shower is? (No wisecracks please) I've haven't heard that term before. And can you give examples (Names & Date ranges)?

7 days to surplus - Dave Northrup

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§MSG From: IBMPC --YKTVMV To: IT32730 --VIMVMOA 03/23/93 22:41:10á

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----- ASTRO FORUM appended at 21:15:33 on 93/03/23 GMT (by LUERICH at RALVM0) -

Subject: Meteor observation

Ref: Append at 20:36:27 on 93/03/23 GMT (by NORTHRD at PKMFGVM1)

Slow shower: I assume he means the velocity of the meteors. The Observers Handbook lists average velocity of particles/meteors for each major shower. If the average velocity is high, then the particles would burn up more quickly, so there would be less chance for observation.

Susan Luerich

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§MSG From: IBMPC --YKTVMV To: IT32730 --VIMVMOA 03/24/93 01:33:21á

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----- ASTRO FORUM appended at 00:32:40 on 93/03/24 GMT (by MENGEL at STLVM4) --

Subject: Meteor observation

Ref: Append at 21:15:33 on 93/03/23 GMT (by LUERICH at RALVM0)

Also, is not the PM hours (sunset until local midnight) suppose to be "slower" because of Earth's rotation away from it's orbital vector? I have always read that the best time (quantity wise) for meteor viewing was in the early AM. Is this a correct assumption?

Tom Mengel (AIX/ESA DFDSM Device Support San Jose, CA)

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§MSG From: IBMPC --YKTVMV To: IT32730 --VIMVMOA 03/24/93 01:43:09á

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----- ASTRO FORUM appended at 00:45:50 on 93/03/24 GMT (by LUERICH at RALVM0) -

Subject: Meteor observation

Ref: Append at 00:32:40 on 93/03/24 GMT (by MENGEL at STLVM4)

Yes, the best time to observe meteors is purportedly between midnight and dawn, but I believe it is because that is when the earth is turning into the path of the meteors. Before midnight, the earth may be blocking some of them. So, in this case, it's not the velocity, but just the opportunity to see them which is improved.

Susan Luerich

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§MSG From: IBMPC --YKTVMV To: IT32730 --VIMVMOA 03/24/93 11:59:28á

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----- ASTRO FORUM appended at 10:59:33 on 93/03/24 GMT (by ALEXD at WINVMJ) ---

Subject: Meteor observation

Ref: Append at 11:05:20 on 93/03/22 GMT (by ALEXD at WINVMJ)

Many thanks to all who responded. The general consensus seems to be

that such a meteor is not an uncommon phenomenon in nature, but is not often observed. I count myself fortunate to have seen such a wonderful display.

Alex Down

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/25/93 10:06:22á

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----- ASTRO FORUM appended at 09:07:03 on 93/03/25 GMT (by EJWWEEST at WINVMZ) -  
Subject: Meteor observation  
Ref: Append at 11:05:20 on 93/03/22 GMT (by ALEXD at WINVMJ)

I actually saw this same fireball from my back garden after packing up from a variable star observing session. Just glimpsing it, I'd say it was at least mag -6, had a long white train of over 30 degrees which too several seconds to fade. Time was around 2307 UT, 19th March.

Going back nearly 20 years when I was active in a fireball program for the BAA, I'd estimate an event like this being reported in the UK about 1 or 2 a year, but an individual seeing one far less frequently. It was pure luck that I saw it - if I'd gone in a few minutes earlier I'd have missed it.

The 19th was a lucky night for me: the variable star U Gem went into outburst that night after over 200 days at minimum and that night was my first observation of it!

E James W West

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/29/93 23:43:16á

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----- ASTRO FORUM appended at 21:42:20 on 93/03/29 GMT (by BOWKER at CANVM2) --  
Subject: Meteor observation - 'slow' shower  
Ref: Append at 20:36:27 on 93/03/23 GMT (by NORTHRD at PKMFGVM1)

Just returning from some time off to see that many have commented on this. Yes, a meteor which has to 'catch up' with the Earth has a much lower relative speed than one that hits head on, yet is still moving fast enough to burn quite nicely. Then, the angle of attack has to be very shallow to stretch the burn time. (I suppose it's possible for the orbits and speeds to match almost exactly, so the rock makes a three-point landing and is still as cold as outer space..!)

Meteor showers are debris flowing in a predictable orbit, which thus has a common and repeated orientation to the Earth's, and so the average speed of entry is a characteristic of each shower.

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/30/93 03:21:44á

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----- ASTRO FORUM appended at 01:22:32 on 93/03/30 GMT (by JFROGERS at RCHVMX)  
Subject: Meteor observation - three-point landing  
Ref: Append at 21:42:20 on 93/03/29 GMT (by BOWKER at CANVM2)

Such a very slow meteorite was in the news within the last couple of years, one roughly soft-ball size that bounced to a stop within a few paces of a young boy, but I don't recall other details. I would guess that it had already bounced at least once by the time it reached that point. It could have also been a fragment "exploded" off of a bigger one in such a direction as to slow it down further on re-entry.

Jim Rogers

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/30/93 20:07:08á

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----- ASTRO FORUM appended at 18:07:00 on 93/03/30 GMT (by BASIL at TOROVM1) --  
Subject: Meteor observation - three-point landing  
Ref: Append at 01:22:32 on 93/03/30 GMT (by JFROGERS at RCHVMX)

I a little confused by the "three-point landing" explanation. Since the gravitational force between Earth and the meteor accelerates the meteor towards the Earth, it doesn't matter what the relative delta-V between the two is; the meteor will slam into, not land on, the Earth.

Basil Burgess  
Advanced Technology Centre, IBM Canada  
TOROVM1(BASIL) (416)474-2518 t/l 241-2518

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 03/30/93 21:15:32á

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----- ASTRO FORUM appended at 19:15:44 on 93/03/30 GMT (by JFROGERS at RCHVMX)  
Subject: Meteor observation - three-point landing  
Ref: Append at 18:07:00 on 93/03/30 GMT (by BASIL at TOROVM1)

If it approaches the earth slowly, or is decelerated by some mechanism like exploding backwards off of a bigger meteor, it could wind up moving at normal aerodynamic terminal velocity for an iron rock dropped from a great height (without any math I'd guesstimate 200 mph or so), which wouldn't blast a crater unless it hit soft earth, and even then it wouldn't go very deep, although it could knock a nice chip out of a concrete road. I'd surmised that in that reported case it may have already bounced once or more before the boy saw it, which would of course really slow it down. If it's moving fast enough to burn, it's moving far faster than terminal velocity.

Jim Rogers

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 04/03/93 06:36:53á

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----- ASTRO FORUM appended at 04:39:43 on 93/04/03 GMT (by BLAMBERT at CLTVMF)  
Subject: Meteor observation - three-point landing  
Ref: Append at 19:15:44 on 93/03/30 GMT (by JFROGERS at RCHVMX)

I heard that that meteor that the boy saw land did make a small

crater. I doubt that any meteor would bounce in any significant way. Because the atmospheric drag on a meteor is proportional to its areal surface (proportional only to the square of the radius), whereas its energy is proportional to its mass, and its mass is proportional to the cube of its diameter, a larger meteor will create a crater that is "out of proportion" to its diameter. The meteor that hit that automobile in New York was "football" sized and did really no significant damage. I have read that the Tunguska Siberia meteor is estimated to be about 100 meters in diameter, some 300 times the diameter of the New York meteorite, yet it clearly did much more than 300 times the damage of that New York stone. Aren't we overdue for a really good ripper, like the one that apparently decimated the dinosaurs? We should invest in Kodak, because there will be some great sunsets to take pictures of when it happens.

Bruce "born surplus" Lambert

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 04/05/93 04:33:11á

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----- ASTRO FORUM appended at 02:35:32 on 93/04/05 GMT (by RAFTEN at POKVMCR3)  
Subject: Meteor observation - three-point landing  
Ref: Append at 04:39:43 on 93/04/03 GMT (by BLAMBERT at CLTMVF)

I've been hearing from several sources that while a large meteor/asteriod hit the earth about the time that the dinosaurs died off (and they found the crater in the Yucatan / Mexico), this impact \*did not\* cause the extinction. Dinosaurs were dying off at least 8 million years before the impact. There are still questions on why they died off, but meteor is no longer the main answer.

PS. Some other reasons include:

- Environmental changes: The Earth naturally cooled off
- Competition from Mammals
- Competition from other Dinosaurs migrating in from over the Alaska/Siberia land bridge

PPS. Reference the National Geographic - Jan 93 issue, and the PBS series on Dinosaurs, aired in December 92 for more info.

David Raften

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\$MSG From: IBMPC --YKTMV To: IT32730 --VIMVMOA 04/07/93 04:01:41á

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----- ASTRO FORUM appended at 02:03:54 on 93/04/07 GMT (by PFC at KGNVMZ) -----  
Subject: Meteor observation - three-point landing  
Ref: Append at 02:35:32 on 93/04/05 GMT (by RAFTEN at POKVMCR3)

Gary Larsen, the "Far Side" cartoonist, provides the REAL reason why dinosaurs became extinct - he shows about 3 or 4 huddled behind a tree, dragging on cigarettes.

Pat Caffrey AIX High-End Performance, ES/KGN

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